REMARKS

The Office Action dated January 21, 2004 has been received and carefully noted. The above amendments to the drawings and claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-5 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 29 and 44 have been cancelled. No new matter has been added, and no new issues are raised which require further consideration and/or search. Claims 1-15, 17-28, 30-43 and 45 are submitted for consideration.

The Office Action objected to Figures 1a, 1b, 1c, and 2. The legend -- Prior Art -- has been added to figures 1a, 1b, 1c, and 2. Therefore, Applicants request that the objection be withdrawn.

Figure 5b was objected to because it includes the reference signs 500b, 509, and 550 not mentioned in the description. Applicants submit that reference sign 500b is mentioned at least in paragraph 0072, second line and paragraph 0096, third line. Figure 5b has been amended to remove reference signs 509 and 550. Therefore, Applicants request that the objection be withdrawn.

Figure 7 was objected to because it includes the reference sign 710 not mentioned in the description. Figure 7 has been amended to remove reference sign 710. Therefore, Applicants request that the objection be withdrawn.

Figure 8 was objected to because it includes the reference signs 800 and 801 not mentioned in the description. Applicants submit that the reference sign 801 is mentioned

in paragraph 0130, line six. Figure 8 has been amended to remove reference sign 800. Therefore, Applicants request that the objection be withdrawn.

Figure 9 was objected to because it includes the reference signs 910 and 911 not mentioned in the description. The specification has been amended to overcome this objection. Therefore, Applicants request that the objection be withdrawn.

Claims 2 and 4 were objected to because of informalities. Claims 2 and 4 have been amended to overcome the objections. Therefore, Applicants request that the objections of claims 2 and 4 be withdrawn.

Claims 29 and 44 were objected to because of improper dependency. Claims 29 and 44 have cancelled. Therefore, the objection of claims 29 and 44 is moot.

Claims 1, 4, 7, 12, 13, 16 and 19 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,094,435 to Hoffman et al. Applicants respectfully submit that Hoffman et al fails to disclose or suggest all of the elements in independent claim 1. Claim 1, upon which claims 4, 7, 12, 13, 16 and 19 depend, recites an apparatus including a queue scheduler that distributes a partition worth of bandwidth to a plurality of queues according to a weight assigned to each of the queues so that each of the queues has its own sub-partition worth of data. Each of the queues is capable of holding one or more packet identifiers. The plurality of queues is arranged from a highest priority to a lowest priority, and the queues are serviced by a scheduler until each of the corresponding weights is consumed for each queue. The higher priority queues are serviced before lower priority queues. The scheduler also controls a flow of one or more

packet identifiers from an active populated queue, until either: its unpopulated if less than its sub-partition worth of data has flowed, its sub-partition worth of data has flowed, or the combination of flows from those of said queues that have been active results in said partition worth of data having flowed from said those of said queues that have been active, as a whole. A populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole.

As will be discussed below, Hoffman fails to disclose or suggest the elements of any of the presently pending claims.

Hoffman teaches a system which includes a multi-layer network element, various networks, end stations, router and bridges. The multi-layer network element includes a processor, various memory locations, a switching elements and a plurality of network element ports. Col. 8, lines 38-49. The switching element includes input ports, a forwarding logic, a packet memory manager, and output ports. Col. 9, lines 9-15. Packets in the network element are buffered at each output port before the packet is transmitted across the physical medium to the next or final destination. Queuing at the input and output ports are based on pointers. Col. 18, lines 35-39. Each output port has a plurality of output queues and each queue has a pair of pointer registers to indicate the

beginning and the end of the queue. Col. 18, lines 49-67. The forwarding logic passes global priority information to the input and output ports to classify packets into different queues. The output port uses the global priority information to determine to which queue a given packet will be forwarded. Col. 19, lines 28-40. The output port also includes a scheduler which allocates fixed rates to each queue for transmission within the output port. Each queue in each output port has associated with it three programmable registers which contain the weights to be used for their associated queue. In one embodiment, the scheduler will not service a lower priority queue as long as there are packets in the higher priority queues. In another embodiment, the scheduler polls each queue and services the packets based on the associated weight of the queue before servicing the next queue. In yet another embodiment, the scheduler attempts to enforce the rates over several polling rounds that comprise a frame. Col. 20, lines 24-67. The scheduler services a queue and decrements a transmit register according to the number of bytes transferred until the value of the transmit register is equal to or less than zero. Then the scheduler starts processing the next queue in the round and updates the transmit register of the just serviced queue by adding to the transmit register a quantum of bytes as represented by the value in the weight register. As such, a queue may finish transmitting a packet even if the number of bytes to finish transmitting the packet causes the value of the transmit register to drop below zero. This allows the scheduler to take into account for the queue in the subsequent round or frame, any overrun in the current round or frame. Therefore, when the value in the weight register is added to the value in the transmit register, the

number of packets that the queue may transmit during the next round, or frame is reduced by the amount the queue went over its allocation for the current round or frame. Col. 21, lines 17-35.

Applicant submits that Hoffman does not teach or suggest each of the features now clearly recited in claim 1 and the claims dependent thereon. There is no teaching in Hoffman of controlling a flow of one or more packet identifiers from an active populated queue, until either: its unpopulated if less than its sub-partition worth of data has flowed; its sub-partition worth of data has flowed; or the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole, by a scheduler as recited in claim 1. There is also no teaching in Hoffman that a populated queue is deemed active if it is the highest priority populated queue out of those of said populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of said queues that have been active results in said partition worth of data having flowed from those of said queues that have been active, as a whole, as recited in claim 1. Therefore, Applicant asserts that the rejection under 102(b) should be withdrawn because Hoffman does not teach or suggest each feature of now clearly recited in claim 1 and hence, dependent claim 4, 7, 12, 13, 16 and 19 thereon.

Claim 2 was rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,463,620 to Sriram. The rejection is traversed as being based on a reference that

does not teach all of the elements of claim 2. Claim 2, upon which claim 5 depend, recites a method including the step of dividing a total amount of data, based upon an individual weight assigned to each of a plurality of queues, into an amount of data that each of said queues may service. The method also includes the step of servicing one or more populated queues. Each of the servicing of a populated queue continuing until the populated queue is no longer populated or the amount of data determined for the populated queue has been released. The method further includes the step of servicing one or more of the queues that remain populated, if any, until the total amount of data has been released from all of the queues in combination including the servicing of the populated queues.

Sriram teaches an ATM communications network that includes a plurality of interconnected nodes. The nodes include input and output links and each output link from a node is provided with a queuing mechanism which receives ATM cells for delivery into a channel on the output link. Traffic which is to be directed on the output link is selectively directed to a number of different queuing circuits based on the results of classification. The traffic in the queuing circuits is guaranteed a minimum percentage of the total bandwidth available on the output link. A server defines a cycle time period during which it will retrieve cells from all of the queues having cells to send. The server divides the cycle time period into slices, assigns a time slice to each queue and permits each queue to empty cells onto the output link during its respective time slice. The server visits each queue in sequence and removes a predetermined number of cells from each

queue. All queues are visited within the next cycle time defined by the server. At the completion of the cycle time period, the server repeats the cycle of visiting each queue and removing respective predetermine number of cells from the queue. If any one of the queues contains no cells, then the server completely passes over the empty queue and moves on to the next queue in the sequence. If any of the queues contain a number of cells which is less than the predetermined number of cells the server is scheduled to remove during the cycle time period, then the server removes cells from that queue until it is empty and moves on to the next queue to remove its allotted number of cells. Col. 5, line 51- Col. 6, line 46.

Applicant submits that Sriram does not teach or suggest each of the features now clearly recited in claim 2. Claims 2, in part, recites dividing a total amount of data, based upon an individual weight assigned to each of a plurality of queues, into an amount of data that each of said queues may service. Col. 5, line 51-Col. 6, line 46 of Sriram does not teach dividing a total amount of data, based upon an individual weight assigned to each of a plurality of queues, into an amount of data that each of said queues may service as suggested by the Office Action. Instead the cited column of Sriram teaches that a server defines a cycle time period during which it will retrieve cells from all of the queues having cells to send and the server divides the cycle time period into slices, assigns a time slice to each queue and permits each queue to empty cells onto the output link during its respective time slice. There is no teaching or suggestion in Sriram of dividing a total amount of data, based upon an individual weight assigned to each of a

plurality of queues, into an amount of data that each of said queues may service as recited in claim 2. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §102(b) should be withdrawn.

Claims 3, 5, 17 and 32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram in view of Hoffman et al. The rejection is traversed as being based on references that neither teach nor suggest the features in claims 3, 5, 17 and 32. Claim 5 depends on claims 1 and 4 and incorporates all of the elements of claims 1 and 4. Claim 3 recites a method including the step of distributing a partition worth of data across a plurality of queues according to a weight assigned to each of the queues so that each of the queues has its own sub-partition worth of data. Each of the queues is capable of holding one or more packet identifiers. Each of the one or more packet identifiers points to its own packet. The plurality of queues ranges from a highest priority queue to a lowest priority queue. The method also includes the step of flowing a flow of one or more packet identifiers from an active populated queue, until: its unpopulated if less than its sub-partition worth of data has flowed; its sub-partition worth of data has flowed, or the combination of flows from those of said queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole. A populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues

that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole.

Claim 17 recites a method including the step of distributing a partition worth of data across a plurality of queues according to a weight assigned to each of the queues so that each of the queues has its own sub-partition worth of data. Each of the queues is capable of holding one or more packet identifiers. Each of the one or more packet identifiers points to its own packet. The plurality of queues ranges from a highest priority queue to a lowest priority queue. The method also includes the steps of flowing a flow of one or more packet identifiers from an active populated queue, until: its unpopulated if less than its sub-partition worth of data has flowed; its sub-partition worth of data has flowed, or the combination of flows from those of said queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole. A populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole. According to the method if one or more populated queues exist after each of the populated queues has been active, and the combination of flows from those of the queues that have been active results in less than the partition worth of data having flowed from those of the queues that

have been active, as a whole, then the method includes the step of flowing one or more additional flows from the one or more populated queues until the partition worth of data has flowed from the queues as a whole, or until each of the queues is unpopulated if each of the queues becomes unpopulated before the partition worth of data has flowed from the queues as a whole.

Claim 32 recites an apparatus including a scheduler that distributes a partition worth of data across a plurality of queues according to a weight assigned to each of the queues so that each of the queues has its own sub-partition worth of data. Each of the queues is capable of holding one or more packet identifiers. Each of the one or more packet identifiers points to its own packet. The plurality of queues ranges from a highest priority queue to a lowest priority queue. The scheduler controls a flow of one or more packet identifiers from an active populated queue, until: its unpopulated if less than its sub-partition worth of data has flowed; or its sub-partition worth of data has flowed; or the combination of flows from those of said queues that have been active results in said partition worth of data having flowed from said those of said queues that have been active, as a whole. A populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole.

Applicant submits that the combination of Sriram and Hoffman fails to teach or suggest the combination of features recited in claims 3, 5, 17 and 32. These claims, in part, recite distributing a partition worth of data across a plurality of queues according to a weight assigned to each of said queues so that each of said queues has its own sub-partition worth of data, each of said queues capable of holding one or more packet identifiers, each of said one or more packet identifiers pointing to its own packet, said plurality of queues ranging from a highest priority queue to a lowest priority queue. Col. 1, line 58- Col. 2 line 9 and Col. 5, line 51-Col. 6, line 62 of Sriram teach that communication traffic is segregated based on high or low bandwidth, isochronous or non-isochronous, and delay sensitive or delay insensitive. Thereafter, according to Sriram the communication traffic are stored in separate queuing circuits for delivery to a single output line. Sriram further teaches that a service cycle time period is define during which each of the queuing circuits is permitted to deliver cells to an output line and a certain amount of bandwidth is guaranteed to the traffic flowing into each of the queuing circuits. There is no teaching or suggestion in Sriram of distributing a partition worth of data across a plurality of queues <u>according to a weight assigned to each of the queues</u> so that each of the queues has its own sub-partition worth of data as recited in claims 3, 5, 17 and 32. Sriram simply does not discuss or suggest weighting queues. There is also no teaching or suggesting in Sriram that each of the queues is capable of holding one or more packet identifiers, each of the one or more packet identifiers pointing to its own packet as recited in claims 3, 5, 17 and 32. Furthermore, Sriram does not teach or

suggest that the plurality of queues ranges from a highest priority queue to a lowest priority queue as recited in claims 3, 5, 17 and 32. Although Sriram discuses segregating communication traffic, the queues in Sriram are not weighted and there is no priority assigned to any of the queues. If priority is assigned in Sriram, the priority is assigned to the communication traffic.

Claims 3, 5, 17 and 32 also recite, in part, that a populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole. Sriram teaches that the queues are visited in a sequential fashion. As stated above, the queues in Sriram are not assigned priority level. Therefore, Sriram does not teach or suggest that a populated queue is deemed active if it is the highest priority populated queue out of those of the populated queues that have not yet been deemed active, such that populated queues are deemed active in succession until the lowest priority populated queue has been deemed active or until the combination of flows from those of the queues that have been active results in the partition worth of data having flowed from those of the queues that have been active, as a whole as recited in claims 3, 5, 17 and 32. Hoffman does not cure the deficiencies of Sriram as discussed above with regard to claims 3, 5, 17 and 32. Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be

withdrawn because neither Sriram nor Hoffman, whether taken singly or combined, teaches or suggests each feature of claims 3, 5, 17 and 32.

Claims 6, 8-11 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. as applied to claim 1 above in view of Sriram. Claims 6, 8-11 and 14 are dependent on claim 1 described above. Sriram fails to cure the deficiencies in Hoffman as to claim 1 as explained above. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Sriram nor Hoffman, whether taken singly or combined, teaches or suggests each feature of claim 1 and hence claims Claims 6, 8-11 and 14.

Claims 15, 18, 21, 26, 27, 29-31, 33, 34, 36, 41, 42, 44 and 45 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. as applied to claim 1 above in view of U.S. Patent No. 5,982,748 to Yin et al. Claims 15, 18, 21, 26, 27, 29-31, 33, 34, 36, 41, 42, 44 and 45 are dependent on claim 1 described above. Yin et al. teaches a system for controlling admission of connection requests and allocating bandwidth to ensure efficient use of network resources. According to Yin et al., an allocation factor indicates whether an associated service class is fully booked, under-subscribed or over subscribed. A service class is fully booked if the maximum allowable subscribed bandwidth equals to the bandwidth allocated to the service class. The service class is over-subscribed if the maximum allowable subscribed bandwidth is greater than the bandwidth allocated to the service class. The service class is under subscribed if the

maximum allowable subscribed bandwidth less than the bandwidth allocated to the service class.

Yin et al. does not cure the deficiencies in Hoffman as to claim 1 as explained above. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Yin et al. nor Hoffman, whether taken singly or combined, teaches or suggests each feature of claim 1 and hence dependent claims 15, 18, 21, 26, 27, 29-31, 33, 34, 36, 41, 42, 44 and 45.

Claims 20, 22-25, 28, 35, 37-40 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. in view of Yin et al. as applied to claim 15 above and further in view of Sriram. Claim 15, which is dependent on claim 1, recites that each of the weights add up to the value that represents more than 100% of the partition worth of data. There is no teaching or suggestion in Yin et al. that that each of the weights add up to the value that represents more than 100% of the partition worth of data as recited in claim 15. Nevertheless, Yin et al. does not cure the deficiencies in Hoffman as to claim 1 as explained above. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Yin et al., Sriram nor Hoffman, whether taken singly or combined, teaches or suggests each feature of claim 1 and 15 and hence dependent claims 20, 22-25, 28, 35, 37-40 and 43.

Furthermore, Applicant respectfully submits that the Office Action has pieced together three references to teach the claimed invention. However, MPEP 2143.01 instructs that "[t]he mere fact that references can be combined or modified does not

render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990)." MPEP 2143.01 further instructs that "[a]lthough a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.'" Applicant respectfully submits that the cited references do not provide such a suggestion or motivation. Applicant submits that the only motivation to piece together the three references of the Office Action is found in Applicant's own invention. MPEP 2141, under the heading "Basic Consideration Which Apply to Obviousness Rejections," points out that "the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention." (See also Hodosh v. Block Drug Co., Inc. 786 F.2d 1136, 229 USPQ 182 (Fed. Cir. 1986).) The Federal Circuit has clearly held that "the motivation to combine references cannot come from the invention itself." Heidelberger Druckmaschinen AG v. Hantscho Commercial Products, Inc., 21 F.3d 1068, 30 USPQ 2d 1377 (Fed. Cir. 1993).

In view of MPEP 2144.03, absent any teaching or suggestion in the prior art to adapt the teachings of Hoffman or Sriram to meet the claimed invention, and because the rejection lacks evidence of a teaching or suggestion that the features would have been obvious to one of ordinary skill, the rejections under 35 U.S.C. §103(a) are improper.

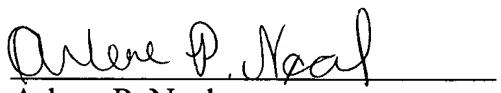
As noted previously, claims 1-15, 17-28, 30-43 and 45 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It

is therefore respectfully requested that all of claims 1-15, 17-28, 30-43 and 45 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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